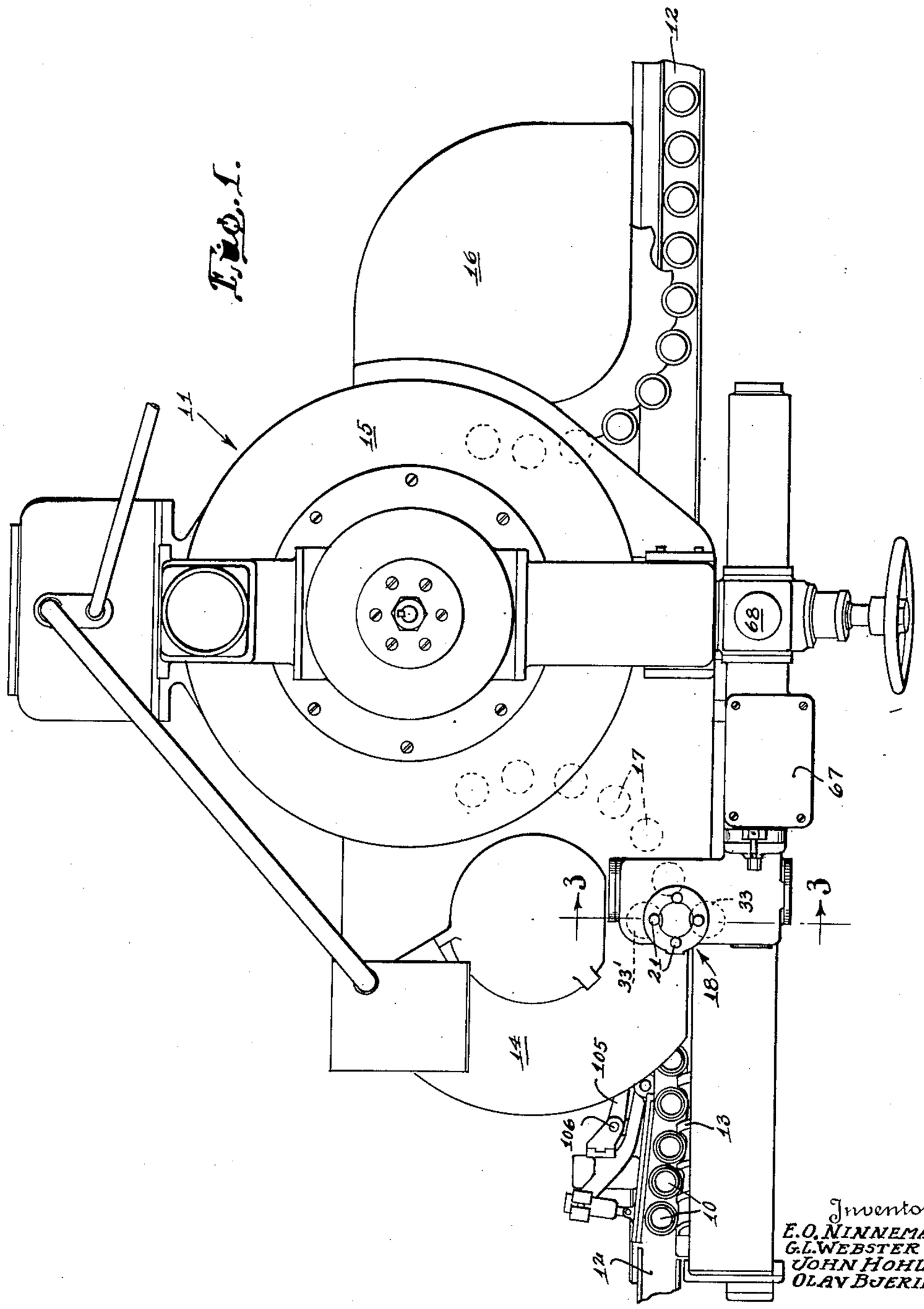
Nov. 17, 1953 E. O. NINNEMAN ET AL 2,659,522

CAP FEEDING MECHANISM

Filed Nov. 30, 1950 6 Sheets-Sheet 1

Fig. 1.



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CAP FEEDING MECHANISM

Filed Nov. 30, 1950 6 Sheets-Sheet 2

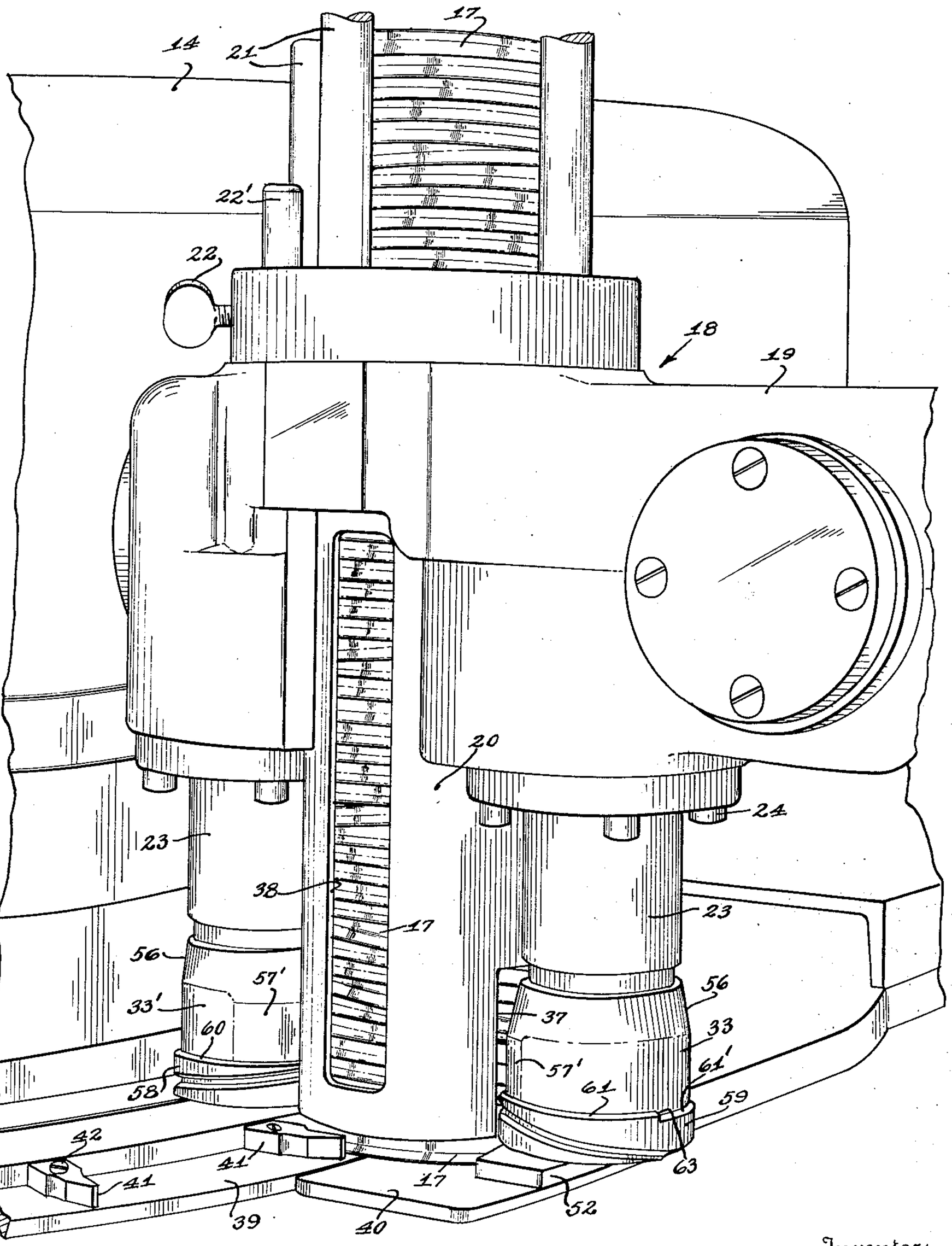

Fig. 2.

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CAP FEEDING MECHANISM

Filed Nov. 30, 1950 6 Sheets-Sheet 3

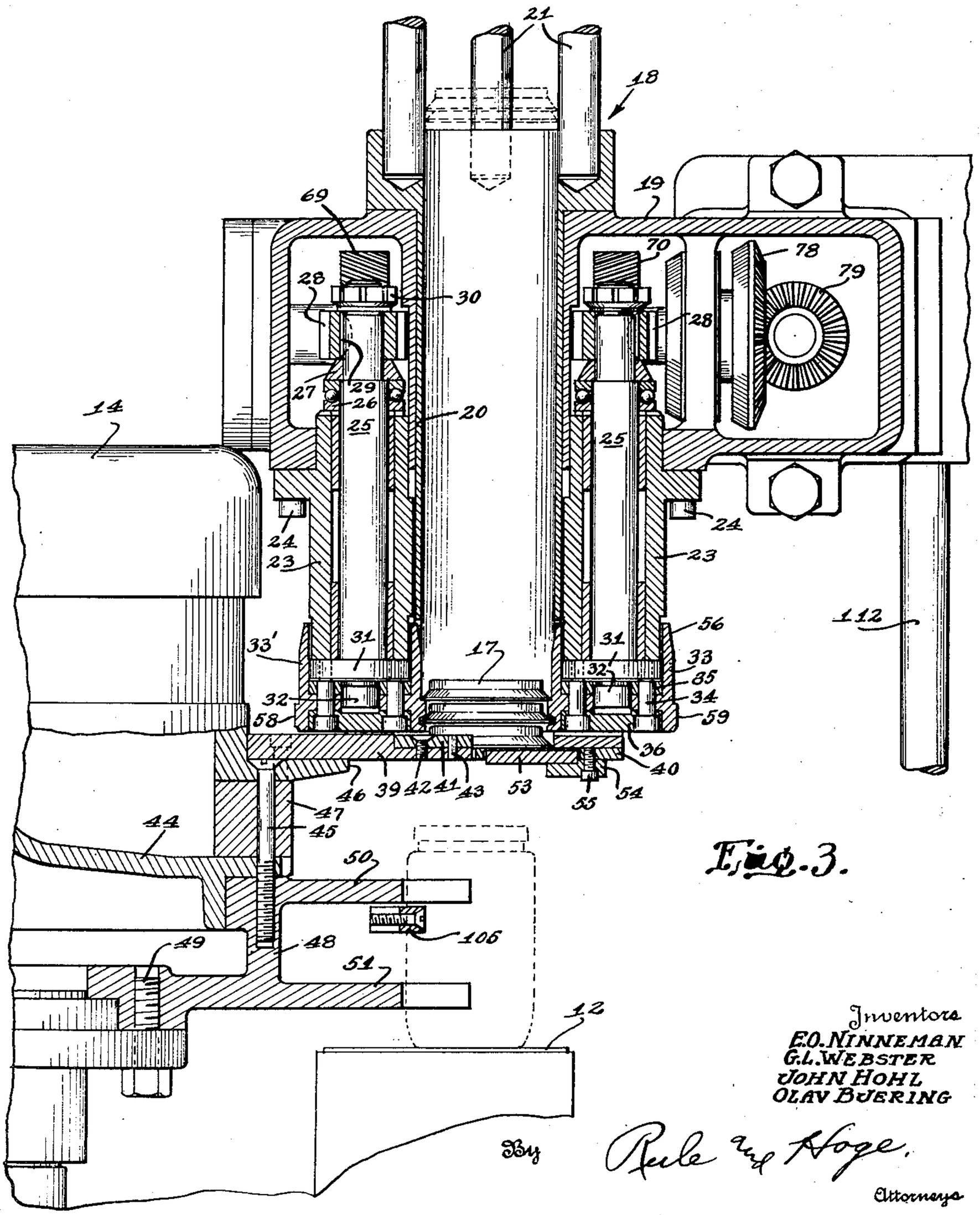

Fig. 3.

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CAP FEEDING MECHANISM

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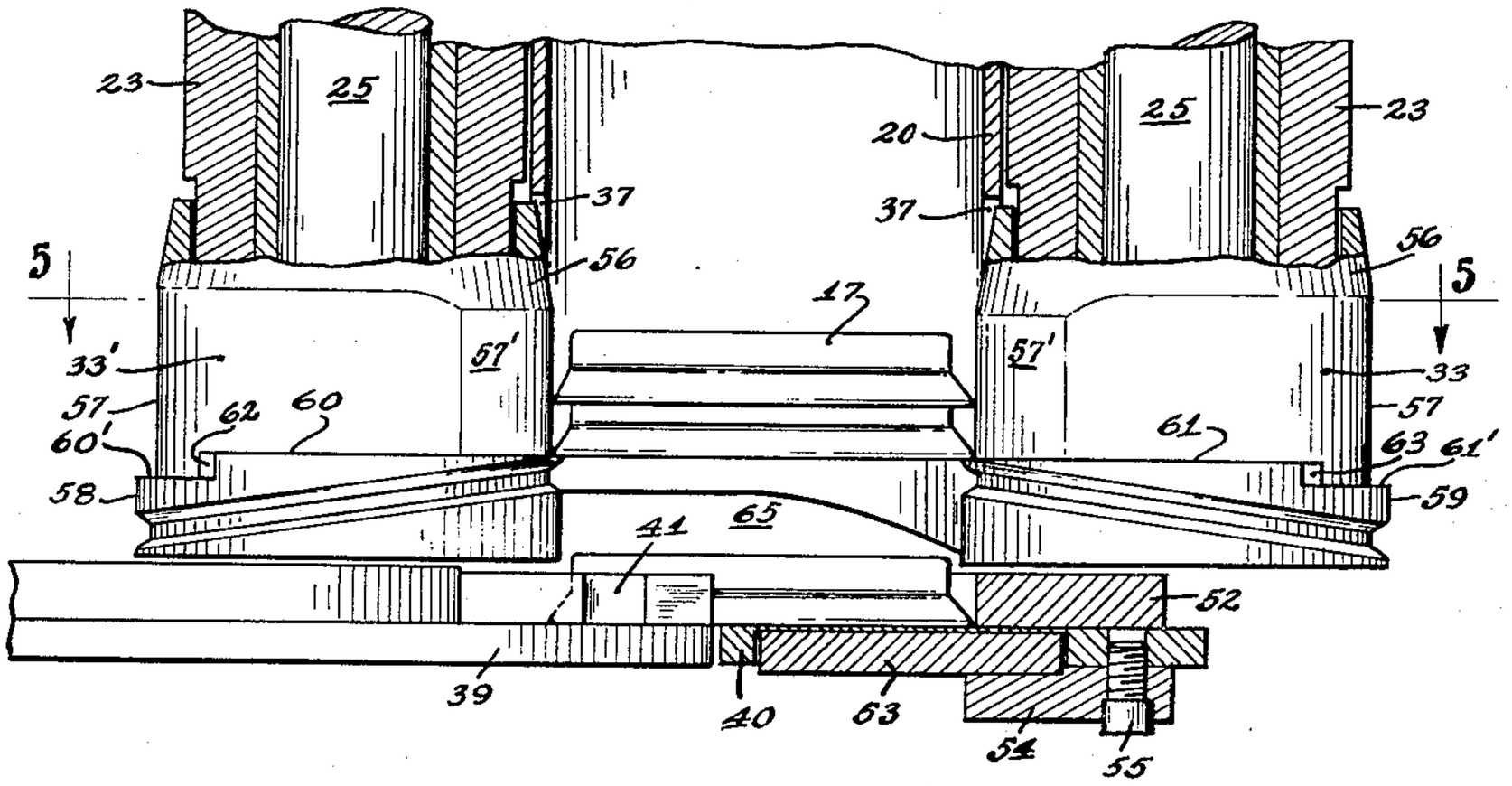

Fig. 4.

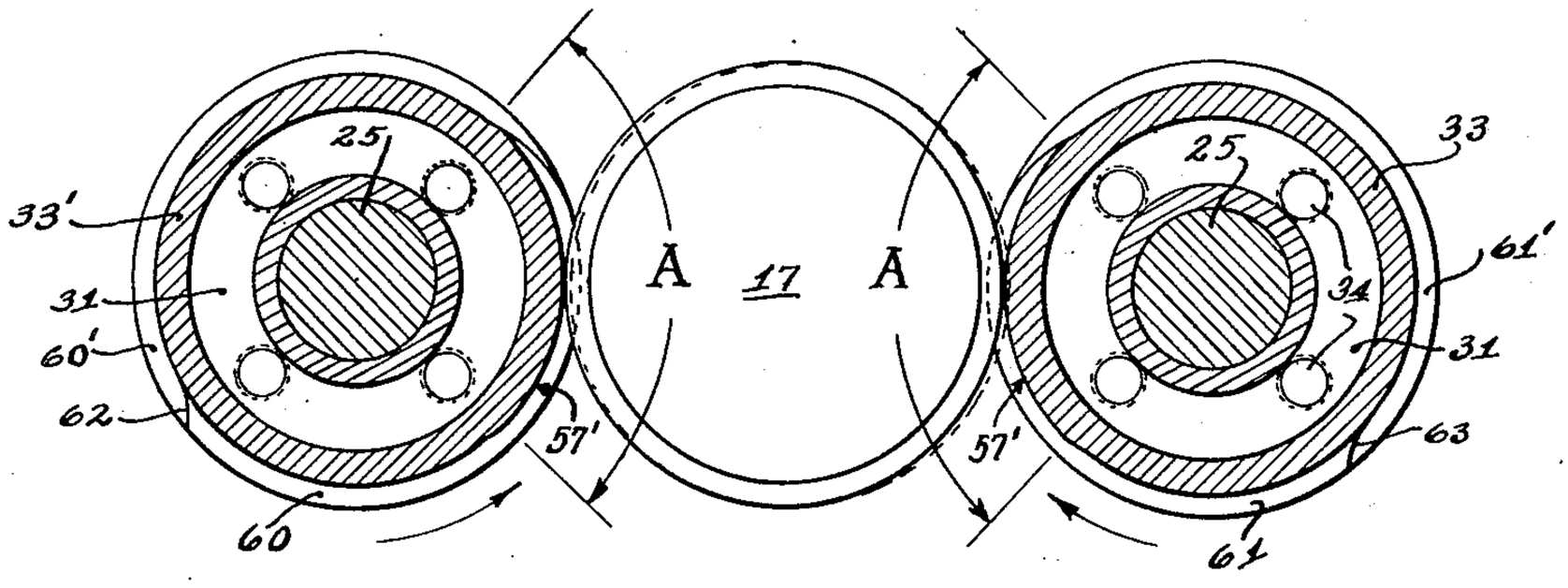

Fig. 5.

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CAP FEEDING MECHANISM

Filed Nov. 30, 1950 6 Sheets-Sheet 5

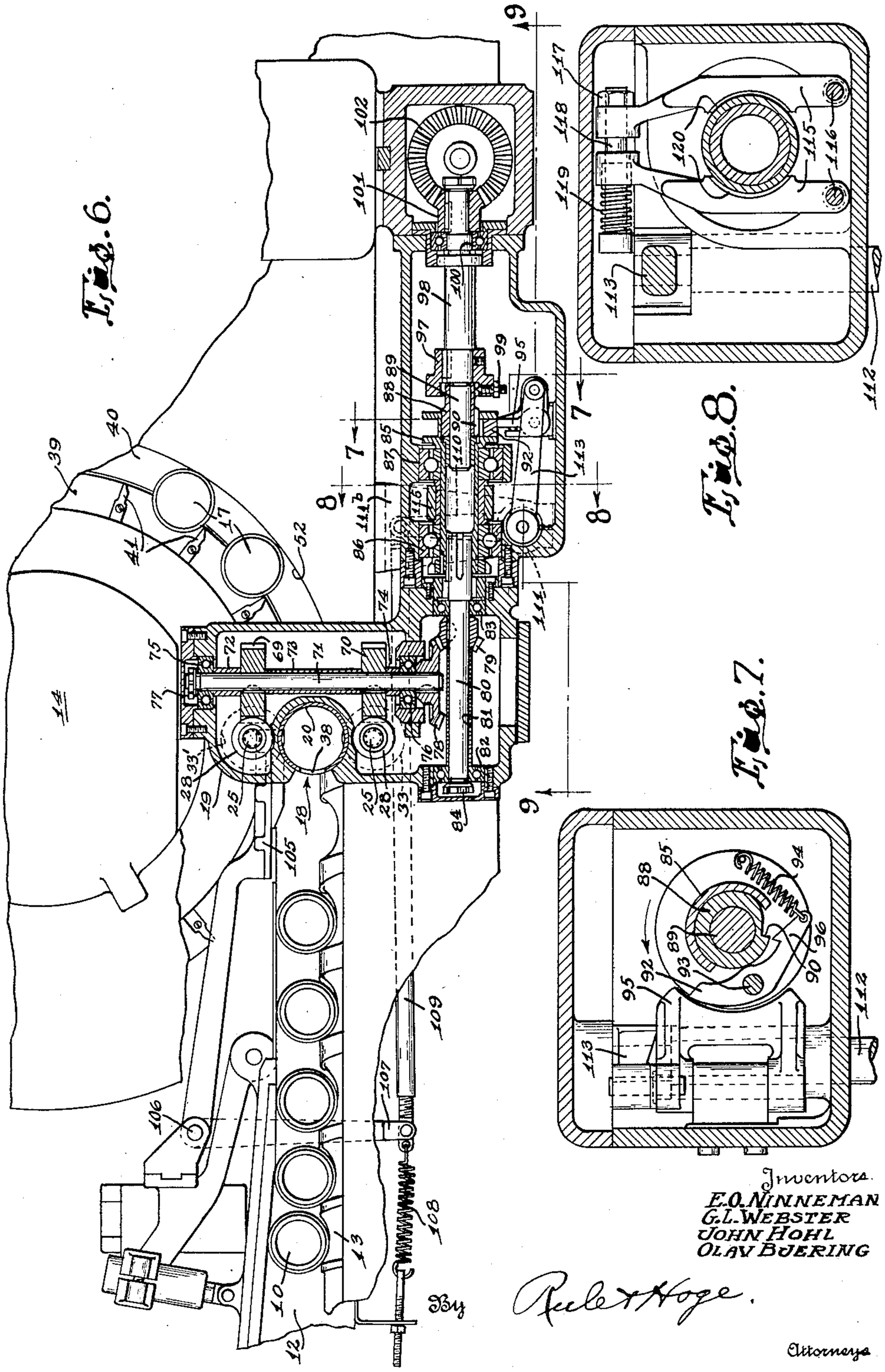

Fig. 6.

Fig. 8.

Fig. 7.

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CAP FEEDING MECHANISM

Filed Nov. 30, 1950 6 Sheets-Sheet 6

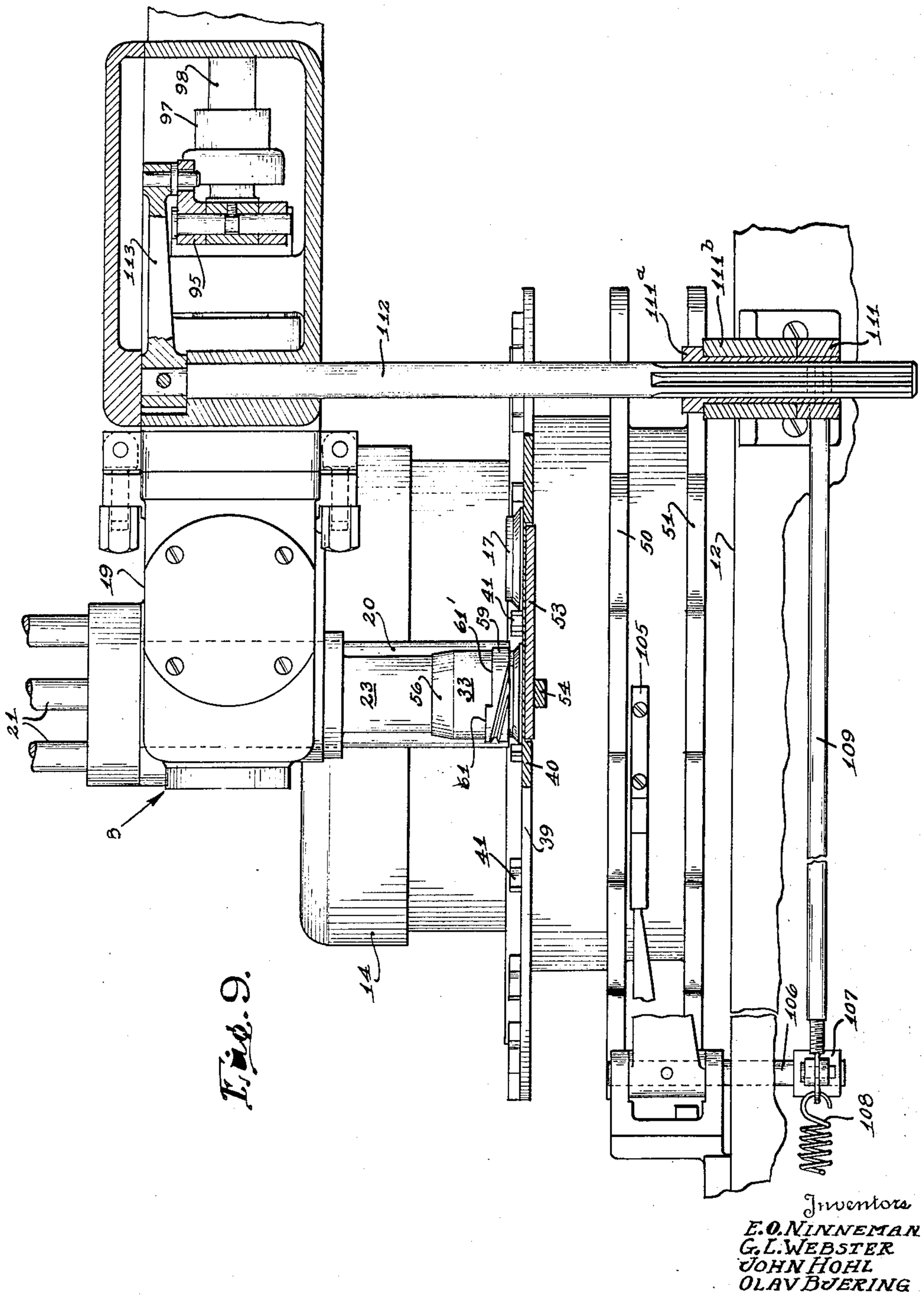

Fig. 9.

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UNITED STATES PATENT OFFICE

2,659,522

CAP FEEDING MECHANISM

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Application November 30, 1950, Serial No. 198,461

14 Claims. (Cl. 226—88.1)

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This invention relates to container sealing apparatus and more particularly to apparatus for feeding closure caps for later application to glass containers.

In the present high speed operation of contaainer sealing machines which utilize so-called stack feeding of closure caps, the closure caps often become misarranged. This results in jamming of the feeding mechanism or mutilation of the closure caps. Since the operator is occupied in keeping the stack of caps sufficiently high, he is unable to remedy the misarrangement. Frequently, the caps are inserted in an inverted position and this also results in jamming of the feed mechanism. These difficulties result in the direct stoppage of production and a high degree of waste in materials and manpower.

It is therefore an object of this invention to eliminate the aforementioned difficulties by providing a mechanism whereby a closure cap is positively fed from a stack of closure caps without jamming or mutilation of the closure cap.

It is a further object of this invention to provide a mechanism whereby a cap is delivered only when there is a container below and in register with the cap.

It is a further object of this invention to provide a feeding mechanism which will feed caps even though they are in an inverted position.

Other objects of the invention will appear hereinafter.

Referring to the drawings:

Fig. 1 is a diagrammatic plan view of a rotary sealing machine in which the present invention may be embodied and produced;

Fig. 2 is an isometric elevational view of the cap feeding mechanism;

Fig. 3 is a fragmentary sectional view at the line 3—3 on Fig. 1 on an enlarged scale;

Fig. 4 is a part sectional fragmentary elevational view of the feed rolls on the cap feed mechanism;

Fig. 5 is a sectional view at the line 5—5 on Fig. 4;

Fig. 6 is a part sectional plan view of the portion of the rotary sealing machine which embodies our invention;

Fig. 7 is a sectional view at the line 7—7 on Fig. 6;

Fig. 8 is a sectional view at the line 8—8 on Fig. 6; and

Fig. 9 is a sectional view at the line 9—9 on Fig. 6.

Basically, our invention comprises a mechanism which includes means for guiding a stack of caps between two rotating rolls, means on said rolls for aligning misarranged caps, and means on said rolls for separating a single cap from the stack and delivering or feeding the cap to a moving plate below the cap feed mechanism. In addition, our invention includes means for actuating the feed mechanism to feed a closure cap only when a container is positioned below and in register with the cap feeding device.

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Referring to Fig. 1 previously filled containers 10 are fed into a sealing machine 11 by suitable means herein shown as a conveyor 12 and a spiral spacer and timer 13. The sealing machine comprises 3 sections, 14, 15 and 16. As the containers pass through the first section 14, closure caps 17 are delivered or fed by the cap feeding mechanism 18 into registry with the containers and are carried along above and in register with the containers by suitable means hereinafter described. Additional means are included to insure that a cap will only be delivered when the container is below and in register with the cap as hereinafter described.

The caps and containers are then transferred from the first section 14 to the center section 15. In this section the caps and containers may be subjected to inert gas or vapor or other head space treatment and then the caps are sealed to the containers. The sealed containers are then removed by the third section 16.

As shown in Figs. 2 and 3, the cap feeding mechanism includes a gear housing 19 mounted above the path of the containers. A cylindrical sleeve or bushing 20 projects through an opening in the gear housing in registry with the containers passing therebelow. The upper portion of the sleeve is in the form of a collar and is provided with guide rods 21 set therein and a set screw 22 acting upon a fixed rod 22' to mount the sleeve in fixed relation with the gear housing. The sleeve 20 acts as a guiding and retaining means for the stack of caps 17 (Fig. 2). The diameter of the sleeve is slightly greater than the diameter of the caps. Tubular projections 23 are fastened to the gear housing 19 and project downwardly on either side of the path of the containers. Drive shafts 25 extend through the projections and are spaced thereon by bushings. Bearings 26, spacers 27, and gears 28, are provided on the upper part of the drive shafts 25. The gears 28 are keyed to the shafts by keys 29 and are rotated by a gear train hereinafter described. The entire shafts 25 are held in position by nuts 30. The lower portion of each shaft 25 is provided with a flange 31 extending outwardly substantially to the extremities of the tubular projections, and a center projection 32 extending

downwardly. An inside or left-hand feed roll **33'**, and an outside or right-hand feed roll **33** are mounted on the drive shaft by bolts **34** and are held in proper spaced relationship by spacers **35**, **36**. The projection **32** extends into an opening in the rolls and aids in the proper centering thereof.

As shown in Fig. 2, portions of the sleeve **20** are cut away to provide spaces **37** into which the feed rolls partially extend for reasons hereinafter described. In addition, a section of the sleeve **20** is cut away to provide an opening **38** for viewing the movement and number of caps in the sleeve.

The feed rolls **33**, **33'** remove a cap **17** from the stack and deliver it as presently described. A rotating plate **39** and a stationary plate **40** are provided below the cap feeding mechanism to receive the cap after it has been delivered by the cap feed rolls as hereinafter described. Lugs or fingers **41** are positioned along the periphery of the rotating plate **39** and are held in position thereon by screws **42** and dowel pins **43**. The plate **39** is mounted for rotation with the carriage **44** by means of bolts **45** and spaced therefrom by spacers **46**, **47**. A spider or star wheel **48** is also mounted on the carriage by the bolt **45** and a bolt **49**. The star wheel includes a series of projections **50** and **51** which extend into the path of the containers and guide the containers below and in register with the caps. A guide rail **52** is provided on the stationary plate **40** to aid in guiding the movement of the caps. A magnet **53** is positioned directly beneath the cap feed mechanism and is set in the stationary plate **40** and held therein by retaining lug **54** and screw **55**. The magnet acts to pull the discharged cap quickly downward onto the plate **40** and also to retard any tendency of the cap to move forward with the rotating plate **39** prior to being contacted by the lug **41**.

As shown in Figs. 4 and 5 the lower portion of the tubular projections **23** is of slightly less diameter than the upper portion.

Referring to Fig. 4, the feed rolls **33**, **33'** include an upwardly and inwardly tapered upper section **56**, a cylindrical center section **57** and lower threaded sections **58**, and **59**. The upper part of the inwardly tapered portion **56** extends slightly beyond the inside diameter of the sleeve **20** to permit the caps to move between the rolls without jamming. A portion of the cylindrical center section **57** is raised to form a camming surface **57'**. As shown in Fig. 5 this surface extends throughout the angle A which has been preferably found to be about 90°.

The threaded sections **58** and **59** are separated from the center cylindrical sections **57** by ledges **60**, **61**. The continuity of the ledges is broken to provide sharp drop-offs **62**, **63**. As shown in Fig. 5 each of the threaded portions begins at a point on the ledge diametrically opposite from the drop-offs and extends around said rolls to a point substantially below and slightly beyond the drop-off points. As further shown in Figs. 4 and 5, the camming section **57'** also begins substantially on a line extending vertically from the beginning of the thread and extends in the same direction as the thread for the required distance.

As previously pointed out the diameter of the sleeve **20** is slightly greater than the diameter of the caps to facilitate the easy movement of the caps through the sleeve. As the caps reach the tapered surfaces of the said rolls they are brought more nearly to the center of the feed mechanism. As viewed from the top in Fig. 5,

the left-hand roll **33'** rotates in a counter-clockwise direction and the right-hand roll **33** rotates in a clockwise direction. As the feed rolls are rotated the camming portions **57'** come into contact with the caps and thereby straighten and align the caps (Figs. 4, 5). This action is obtained because the space between the camming surfaces when they are opposite each other is equal to or slightly less than the diameter of the caps. Upon further rotation of the rolls the entire stack is subjected to the drop-offs **62** and **63** and the stack drops onto the ledges **60'** and **61'**. These drop-offs act to further aid in straightening and aligning the caps. Upon further rotation of the feed rolls, the flanges of one of the caps enter the screw threads and the cap is removed from the stack and delivered by the threads.

As soon as the cap is released the magnet **53** pulls the right-hand portion of the cap quickly downward to prevent the cap from freely moving about and jamming the mechanism during the high speed operation. The lugs **41** contact the left-hand portion of the cap and push it along with the rotating plate **39**. As shown in Fig. 4, the lower portion of the sleeve **20** is cut away to provide a space **65** adjacent to the inside or left-hand roll **33'**. This construction facilitates the removal of the cap from the sleeve inasmuch as when the right-hand portion of the cap is quickly brought downward by the magnet, an additional space is needed to prevent the left-hand portion of the cap from being jammed against the rear part of the sleeve.

It has been found that the particular construction of the cap feeding mechanism will not only result in a positive feed without jamming but will also operate to feed caps which may inadvertently be placed in the stack in an upside-down position.

Referring to the diagrammatic plan view in Fig. 1, the cap feeding mechanism **18** is driven by a gear linkage through a clutch mechanism **67** from a power source **68**. As shown in Fig. 6, the gears **28**, which rotate the shafts **25** on which the rolls are mounted, are meshed with gears **69** and **70** keyed to the shaft **71** and spaced thereon by spacers **72**, **73** and **74**. The shaft **71** is mounted in bearings **75** and **76** and is provided with a retainer nut **77** at one end and a beveled gear **78** at the other. The beveled gear **78** is meshed with a second beveled gear **79** keyed to the shaft **80** and spaced thereon by spacer **81**. The shaft **80** is mounted in bearings **82**, **83** and is provided at one end with a retainer nut **84**. The other end of the shaft passes through the gear housing and is slidably keyed to a pawl carrier **85**. The slidable connection between the shaft **80** and the pawl carrier **85** permits easy removal of the cap feed mechanism when it is desired to replace the cap feed mechanism with one which will feed a different size. The pawl carrier **85** is mounted in bearings **86**, **87** in the clutch housing and includes a tubular portion into which a spacer and a cap feed clutch **88** project. The cap feed clutch **88** is keyed to a shaft **89** and as shown in Fig. 7 includes a single tooth or latch **90** on its periphery. The pawl carrier includes an annular space in which a pawl **92** is mounted. The pawl **92** is pivoted at a point **93** on the pawl carrier and is formed with a latch portion **96** held inwardly under the action of the spring **94**. The pawl stop **95** is mounted in the clutch housing and actuated as hereinafter described to hold one end of the pawl

inwardly and prevent the latch portion 96 of the pawl from engaging the tooth 90 of the cap feed clutch 88.

The right-hand end of the cap feed clutch is in the form of a gear and projects into a clutch drive flange 97 keyed to a drive shaft 98. A set screw and lock nut 99 are provided to project between the gear teeth and adjust the relative position of the cap feed clutch to the drive flange for setting and timing the cap feed drive. The drive shaft 98 extends through a bearing 100 in the clutch housing and has a beveled gear 101 keyed thereto. The beveled gear 101 is in mesh with beveled gear 102 which in turn is driven by a constant speed source (not shown).

It can be seen that the power shaft 98 including the drive flange 97, the shaft 89 and the cap feed clutch 88 are continuously driven at a constant speed. Moreover, as long as the pawl stop 95 is in contact with the pawl 92, keeping the latch 96 away from the tooth 90 (Fig. 7), the pawl carrier and the remaining linkage will not be rotated. However, when the pawl stop is moved out of contact with the pawl 92 the spring 94 will cause the pawl to pivot about the pin 93 and bring the latch portion 96 into engagement with the tooth 90 and be carried along with the cap feed clutch 88. The pawl 92 will in turn cause the pawl carrier 95, shaft 80, gears 79, 78, shaft 71 and gears 69 and 70 to rotate and in turn rotate the shafts 25 and the feed rolls 33, 33'. The gear train is such that a single rotation of the cap feed clutch will cause one cap to be fed from the stack.

The pawl stop 95 is controlled by linkage in such a manner that it is actuated only when a container is approaching the cap feed mechanism and will be in register therewith when the feeding of the cap is desired. This mechanism includes a detector bar 105 placed in the path of the containers and mounted to pivot a shaft 106 and a cross arm 107. The detector bar 105 is held in position in the path of the containers by a spring 108 acting on the cross arm 107. An extensible connector rod 109 extends from the cross bar 107 and is pivoted at one end to an arm 110. This arm 110 carries a collar 111 at one end thereof which collar is secured to a sleeve 111^a, the latter having a spline connection with the lower end of the rock shaft 112. The aforementioned sleeve 111^a is mounted in a bearing 111^b, as shown in Fig. 9. A lever arm 113 extends from the top of the shaft 110 to the pawl stop 95.

The pawl stop 95 is in the shape of a dog leg pivotally mounted in the clutch housing as shown in Figs. 6, 7 and 9.

As a container approaches and contacts the detector bar 105, the entire linkage is actuated moving the pawl stop out of engagement with the pawl and permitting the feed rolls to be driven through the corresponding mechanism and thereby discharge the cap. The timing of the entire mechanism is such that the cap will be discharged at the instant the container is in proper registry and relationship with the cap below the cap feed mechanism. It can furthermore readily be seen that when no container contacts the detector bar 105 the linkage will not be actuated and a cap will not be delivered.

As shown in Figs. 6 and 9, the length of the detector bar 105 is such that when containers are continuously being fed the detector bar will remain in a position away from the path of the containers and the operation of the feed mechanism will be continuous. However, if an open space should appear due to the absence of a container, the detector bar will swing back into the path of the containers. Through the corresponding linkage, the pawl stop 95 will move into the path of the pawl 92 and cause the pawl to move out of engagement with the tooth 90 of the cap feed clutch, stopping the rotation of the feed rolls 33, 33'.

A locking brake is also provided in order that the cap feeding mechanism will stop instantaneously when this occurs. This mechanism is mounted to act upon the pawl carrier and as shown in Fig. 8 includes arms 115 pivoted at points 116 in the clutch housing and held against the body of the pawl carrier by means of a nut and bolt 117, 118 and spring 119. Brake lining 120 is provided to prevent excessive wear of the brake arms. The brake pressure is adjusted by adjusting the tension on the spring 119 which in turn is adjusted by the nut and bolt 117, 118.

Modifications may be resorted to within the spirit and scope of the appended claims.

We claim:

1. An apparatus for feeding closure caps comprising a pair of cylindrical rolls spaced apart and mounted for rotation about their axes, means providing a channel for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly thereby restricting the channel to facilitate travel of the caps between the rolls, and the lower portion of each of said rolls including means for removing a cap from said stack and discharging it when the rolls are rotated.

2. An apparatus for feeding closure caps comprising a pair of vertical rolls spaced apart and mounted for rotation about their axes, means providing a channel for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly thereby restricting the channel to facilitate movement of the caps downwardly between the rolls, the lower portion of each of said rolls being of greater diameter than the center portion and having threads formed on the surface thereof, the threads on each of said rolls being opposite in direction, and means for rotating the rolls.

3. An apparatus for feeding closure caps comprising a series of vertical rolls spaced apart and mounted for rotation on their axes, means for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly to facilitate the downward movement of the caps therebetween, the center portion of each of the rolls having a cylindrical surface, a portion of said cylindrical surface being raised to form a cam, the lower portion of each of said rolls being cylindrical and of larger diameter than the center portion, a sharp ledge forming the line of demarcation between the two cylindrical portions, said sharp ledge including a break in the continuity thereof resulting in a distinct change in level of the ledge, the surface of each of said lower portions being formed with an internal thread, the threads on said surfaces being opposite in direction.

4. An apparatus for feeding closure caps comprising a series of cylindrical rolls spaced apart and mounted for rotation about their axes, means providing a channel for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered up-

wardly and inwardly thereby restricting the channel to facilitate travel of the caps between the rolls, and the lower portion of each of the rolls including means for removing a cap from said stack and discharging it when the rolls are rotated.

5. An apparatus for feeding closure caps comprising a series of vertical rolls spaced apart and mounted for rotation about their axes, means providing a channel for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered inwardly thereby restricting the channel to facilitate movement of the caps downwardly between the rolls, the lower portion of each of said rolls being of greater diameter than the center portion and having threads formed thereon, and means for rotating the rolls.

6. An apparatus for feeding closure caps comprising a pair of vertical rolls spaced apart and mounted for rotation on their axes, means for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly to facilitate the downward movement of the caps therebetween, the center portion of each of the rolls having a cylindrical surface, a portion of the cylindrical surface being raised to form a camming surface, the lower portion of each of said rolls being cylindrical and of greater diameter than the center portion, a sharp ledge forming the line of demarcation between the two cylindrical portions, said ledge including a break in the continuity thereof resulting in a change in level of the ledge, each of said lower portions being formed with a thread, the threads on said rolls being opposite in direction, each of said threads beginning at a point diametrically opposite from the break in the ledge and extending around the lower cylindrical section to a point substantially beyond and below said break in the ledge, said camming surface extending from a point near the beginning of the thread for substantially 90° in the direction of the thread.

7. An apparatus for feeding closure caps comprising a horizontally traveling conveyor for carrying open containers and a cap feeding mechanism mounted above said conveyor and comprising a vertical roll mounted for rotation on either side of the conveyor, means for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly to facilitate the downward movement of the caps therebetween, the center portion of each of said rolls having a cylindrical surface, a portion of said cylindrical surface being raised to form a cam, the lower portion of each of said rolls being cylindrical and of larger diameter than the center portion, a sharp ledge forming the line of demarcation between the two cylindrical portions, said sharp ledge including a break in the continuity thereof resulting in a distinct change in level of the ledge, the surface of each of said lower portions being formed with an internal thread, the threads on the rolls being opposite in direction, and means positioned in the path of the containers and at a distance from the cap feeding mechanism and actuated by the containers to rotate the rolls in opposite directions.

8. An apparatus for feeding closure caps comprising a horizontally traveling conveyor for carrying open containers and a cap feeding mechanism mounted above said conveyor and comprising a vertical roll mounted for rotation on either side of the conveyor, means for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly to facilitate the downward movement of the caps therebetween, the center portion of each of said rolls having a cylindrical surface, a portion of said cylindrical surface being raised to form a cam, the lower portion of each of said rolls being cylindrical and of larger diameter than the center portion, a sharp ledge forming the line of demarcation between the two cylindrical portions, said sharp ledge including a break in the continuity thereof resulting in a distinct change in level of the ledge, the surface of each of said lower portions being formed with an internal thread, the threads on the rolls being opposite in direction, each of said threads beginning at a point diametrically opposite from the break in the ledge and extending around the lower cylindrical surface to a point substantially beyond and below the break in the ledge, said camming surface extending from a point near the beginning of the thread for substantially 90° in the direction of the thread, and means positioned in the path of the containers and at a distance from the cap feeding mechanism and actuated by the containers to rotate the rolls in opposite directions.

9. An apparatus for feeding closure caps comprising a horizontally traveling conveyor for carrying open containers and a cap feeding mechanism mounted above said conveyor and comprising a vertical roll mounted for rotation on either side of the conveyor, means for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly to facilitate the downward movement of the caps therebetween, the center portion of each of said rolls having a cylindrical surface, a portion of said cylindrical surface being raised to form a cam, the lower portion of each of said rolls being cylindrical and of larger diameter than the center portion, a sharp ledge forming the line of demarcation between the two cylindrical portions, said sharp ledge including a break in the continuity thereof resulting in a distinct change in level of the edge, the surface of each of said lower portions being formed with an internal thread, the threads on the rolls being opposite in direction, each of said threads beginning at a point diametrically opposite from the break in the ledge and extending around the lower cylindrical surface to a point substantially beyond and below the break in the ledge, said caming surface extending from a point near the beginning of the thread for substantially 90° in the direction of thread, means for rotating said rolls in opposite directions, a clutch between said means and the rolls for controlling the movement of the rolls, means positioned in the path of the containers and connected to said clutch to actuate said clutch when contacted by a container and drive the rolls thereby discharging a cap from the stack.

10. An apparatus for feeding closure caps comprising a horizontally traveling conveyor for carrying open containers and a cap feeding mechanism mounted above said conveyor and comprising a vertical roll mounted for rotation on either side of the conveyor, means for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly to facilitate the downward movement of the caps therebetween, the center portion of each of said rolls having a cylindrical

surface, a portion of said cylindrical surface being raised to form a cam, the lower portion of each of said rolls being cylindrical and of larger diameter than the center portion, a sharp ledge forming the line of demarcation between the two cylindrical portions, said sharp ledge including a break in the continuity thereof resulting in a distinct change in level of the ledge, the surface of each of said lower portions being formed with an internal thread, the threads on the rolls being opposite in direction, each of said threads beginning at a point diametrically opposite from the break in the ledge and extending around the lower cylindrical surface to a point substantially beyond and below the break in the ledge, said caming surface extending from a point near the beginning of the thread for substantially 90° in the direction of thread, means for rotating said rolls in opposite directions, a clutch between said means for controlling the movement of the rolls, means positioned in the path of the containers and connected to said clutch to actuate said clutch when contacted by a container and rotate the rolls thereby discharging a cap from the stack, a horizontal moving plate mounted between said cap feeding mechanism and the containers on the conveyor and means for moving said plate at the same speed as the conveyor.

11. An apparatus for feeding closure caps comprising a horizontally traveling conveyor for carrying open containers and a cap feeding mechanism mounted above said conveyor and comprising a vertical roll mounted for rotation on either side of the conveyor, means for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly to facilitate the downward movement of the caps therebetween, the center portion of each of said rolls having a cylindrical surface, a portion of said cylindrical surface being raised to form a cam, the lower portion of each of said rolls being cylindrical and of larger diameter than the center portion, a sharp ledge forming the line of demarcation between the two cylindrical portions, said sharp ledge including a break in the continuity thereof resulting in a distinct change in level of the ledge, the surface of each of said lower portions being formed with an internal thread, the threads on the rolls being opposite in direction, each of said threads beginning at a point diametrically opposite from the break in the ledge and extending around the lower cylindrical surface to a point substantially beyond and below the break in the ledge, said camming surface extending from a point near the beginning of the thread for substantially 90° in the direction of thread, means for rotating said rolls in opposite directions, a clutch between said means for controlling the movement of the rolls, means positioned in the path of the containers and connected to said clutch to actuate said clutch when contacted by a container and permit rotation of the rolls thereby discharging a cap from the stack, a moving plate mounted between said cap feeding mechanism and the containers on the conveyor, means for moving said plate at the same speed as the conveyor, and a magnet rigidly mounted below said moving plate and in register with the cap feeding mechanism.

12. An apparatus for feeding closure caps comprising a horizontally traveling conveyor for carrying open containers into a position to receive a cap and a cap feeding apparatus mounted above said conveyor, said apparatus comprising a pair of vertical rolls spaced apart horizontally and mounted for rotation about their axes, means providing a channel for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly thereby restricting the channel to facilitate travel of the caps between the rolls and the lower portion of each of said rolls including means for removing a cap from said stack and discharging it when the rolls are rotated, means for rotating said rolls, a clutch between the last named means and the rolls for controlling the movement of the rolls, means positioned in the path of the containers and at a distance from the cap feeding mechanism and actuated by the containers to actuate the clutch and thereby rotate the rolls.

13. An apparatus for feeding closure caps comprising a horizontally traveling conveyor for carrying open containers into a position to receive a cap and a cap feeding apparatus mounted above said conveyor, said apparatus comprising a pair of vertical rolls spaced apart horizontally and mounted for rotation about their axes, means providing a channel for guiding a stack of closure caps between said rolls, the uppermost portion of each of said rolls being tapered upwardly and inwardly thereby restricting the channel to facilitate travel of the caps between the rolls, the lower portion of each of said rolls being of greater diameter than the center portion and having threads formed on the surface thereof, the threads on each of said rolls being opposite in direction, means for rotating the rolls, a clutch between the last named means and the rolls for controlling the movement of the rolls, means positioned in the path of the containers and at a distance from the cap feeding mechanism and actuated by the containers to actuate the clutch and thereby rotate the rolls.

14. An apparatus for feeding closure caps comprising a pair of cylindrical rolls mounted for rotation about vertical axes and spaced apart, means providing a vertically disposed channel through which a stack of closure caps are fed downwardly, said rolls being positioned beneath and in register with the said channel, the uppermost portion of each of said rolls being tapered upwardly and inwardly, the upper ends of the rolls being spaced apart the full width of said channel to facilitate the travel of the caps from the channel to positions between the rolls, the spacing between the rolls at the bottom of said tapered portions being narrower than the lower end of said channel and thereby restricting the passageway through which the caps are fed, the lower portion of each of said rolls including means for removing a cap from said stack and discharging it while the rolls are rotating.

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